The MAC Flyer

AUGUST 1975

Gen. Carlton at Crash Site. Story on Page 3.

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The MAC Flyer

For Greater Efficiency
in MAC Air Operations

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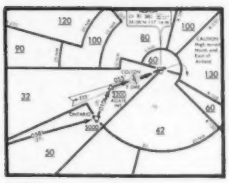
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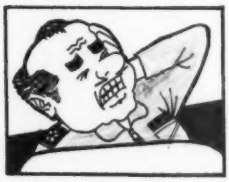
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THE COVER: Gen Paul K. Carlton, Commander, MAC, right; Maj Gen Ralph S. Saunders, center; and Col Edward J. Nash examine the wreckage of a MAC aircraft.

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The Full Extent of Responsibility

General Paul K. Carlton

Not long ago I returned from one of the more unpleasant duties that has befallen me, as a commander. The spring thaw uncovered the crash site of one of our C-141s that had lain buried beneath snow and ice after hitting a mountain last winter. I accompanied members of the accident investigation board to the accident site for the final stage of their grim investigation.

During the course of my military career I have seen the aftermath of numerous air crashes, but have never grown completely conditioned to the experience. I doubt that anyone ever does. The impact of such a tragedy cannot present itself fully to anyone who has not seen the results firsthand. Military and strategic considerations aside — though we cannot afford to cast them aside for very long in the course of our duties — the accidental death of an aircrew member is indeed sad, and is made more so when facts show that it should never have occurred.

I will not review this particular accident. You have all been briefed on many of its aspects and an account appears elsewhere in this issue. Neither is it my intention to place blame. It is too late for that.

In view of some of our recent accidents, I would like to re-emphasize one point to you, the crew members of the world's greatest airlift, weather reconnaissance, and rescue force: As aircrew members, you are tasked with one of the heaviest responsibilities that can be delegated at anytime, by anybody, anywhere — the responsibility not only for your own well-being, but for the lives of your crew mates, passengers and, to a great extent, the future of their families. Assume your responsibilities with this in mind, every minute while you are involved in flying — whether in the air or on the ground. Sustain your own self-awareness of the importance of this tremendous responsibility. And ensure that you take nothing for granted that will jeopardize the trust that so many have placed in you. Simply stated, strive for undiluted professionalism in every aspect of your job — not because I say you should, but because your responsibility to do so involves a great many individuals.

I have had the privilege of being your commander for almost three years now, and together we have participated in some historic events — the airlift of POWs from Hanoi, the Israeli resupply effort, the evacuation of Saigon — and some of the most inspiring rescue missions in the history of aviation. Additional challenges will present themselves in the future.

Therefore we must strive for excellence in the day-to-day duties which form the foundation for future achievement. For the manner in which MAC aircrew members accept these daily responsibilities may well determine just how we respond to future challenges.

Paul K. Carlton

Second Place Winner–
1975 MAC Flying Safety Writing Contest

Professionalism: The Key to Safety

by Capt Richard L. Cecil
76 ARRS
Hickam AFB, Hawaii

There are days, and then there are days. This was one of those days for Lieutenant Case. It had started poorly — the alarm was not set and he was late for briefing. When Captain Coasty, his instructor for the day, suggested that this type of thing normally requires a letter of explanation to the ops officer, Case had dismissed it with a nod, realizing that was the last thing he needed. He knew the ops officer was still a little hacked about that gear-raising incident the two had experienced on a go-around a few days earlier. Case didn't want to dig his hole any deeper.

Captain Coasty said nothing more; nor did he have a whole lot to say when the coffee and lunches didn't show up at the aircraft — and Case found the money in his flight suit pocket. Now, even the crew was unhappy with him. The day got no better and even went downhill from there.

There was the wrong turn in the holding pattern; then there was the time when Case, calling the loadmaster by his first name, told him to open the ramp and door for cargo drops — and the navigator with the same first name thought he was supposed to do it; and there was the ATC controller who told him to turn right and . . . it went on and on. Finally the flight was over, and the debriefing was nearing its end. Now, maybe Case could escape to the sanctuary of the casual bar and wipe the day out of his mind.

Case was lost in his thoughts at this point, but finally his ears stopped popping, the air cleared, and he heard Captain Coasty saying, ". . . and the way I see it, all of your actions today were a direct result of your loose attitude and not having everything together. I also feel that today was not just a bad day, but the results of previous misdirection. I'm going to have to grade you "U" on several areas, mainly safety consciousness and judgment, because there aren't any blocks on the form for the key item, which is professionalism. Several of the things you pulled today were downright unsafe, and I'm not sure you realized it at the time.

During this morning's briefing, you, like everyone else, briefed that safety was paramount during the mission. So what happened? Has that trite saying become so common that we turn it off whenever we hear it? I would prefer to hear something like, 'Professionalism is the word of the day,' because I strongly feel that professionalism is the key to safety! Every individual will have his own definition of professionalism, but the important thing is that it requires a conscious effort to practice it, whereas the concept of safety can be too easily relegated to the subconscious."

The ringing returned to Case's ears, and he could no longer hear all of what Coasty was saying, only that recurring phrase, "Professionalism is the key to safety. Professionalism is the key to — Professionalism — "

Captain Coasty finished filling out the training folder and handed it to Case. "Why don't you take a hard look at today, Lieutenant. If there are any questions, I'll be in early tomorrow," and he left. Case rocked back in the chair and continued thinking about what had just transpired, and all he had done to make Coasty rip him a new one.

Coasty had given Case a good pre-mission briefing, and they

had talked about all of the maneuvers to be covered on the ride. It was a standard pilot proficiency check with a few tactical maneuvers. Case had really been studying the manuals, and his natural inclination was to dazzle Coasty with his footwork. Things went well on the flight, with a few exceptions. There was the wrong turn during the approach, but anyone can do that, thought Case. The ops officer even did it once. Also, during the approach, he had become confused and descended to straight-in minimums during a circling approach!

"Natural mistakes," Case said, almost out loud, by now really worked up with indignation. "Imagine Coasty saying I'm an unsafe pilot, just for small oversights," Case muttered. He pounded his hand on the desk top and stalked from the room, intent on finding out more about his instructor's Safety and Professionalism philosophy. "Hell, I'm professional," Case said to himself. "I keep my manuals posted, hair trimmed, uniform IAW 35-10 for the most part, and I don't fool around in the airplane — no stunts or anything.

To get at the root of this whole thing, Case would have to talk to some of the other guys. Probably a good place to start would be with Lieutenant (soon-to-be-Captain) Forrest, one of the safety officers and the last pilot to upgrade to aircraft commander. He had been Captain Coasty's student too. Maybe Smokey, as his friends called him, had something on Coasty that would help Case.

Case found Forrest in the safety office, writing vigorously. The lieutenant was a Mark Hunter look-alike, with his dark hair and mustache right out of a safety poster.

"Hey, Smokey, got a minute?" called Case. "I had a bad day today with old Coasty, and I need to get something on him. Can you give me any ideas?"

"Ummm, maybe," Forrest said. "What's the deal?"

"Well, I had an upgrade ride with Super Stud and he lambasted me for not being safety conscious and for having poor judgment. In so many words, he told me I was unprofessional because I didn't have my stuff together. I think it was uncalled for, and I need to square it."

"Why don't you tell me what happened," Forrest replied, as he sat back in his swivel chair, looking for all intents and purposes like the oldest, wisest lieutenant in the Air Force.

Case proceeded to tell his story, minimizing some parts, embellishing others. The deep frown on Forrest's face did not offer the reassurance that Case wanted. Lieutenant Forrest thought for a few seconds, then asked, "Do you have your training folder handy? Maybe Coasty's write-up will help. Let's see what he actually wrote down." Case retrieved the folder and Forrest read it, frowning and grinning alternately as he recognized key phrases from his old instructor. "Well, I must say, Coasty was not overly impressed with your footwork. He is usually very straightforward, and I don't view this write-up as being any different from some I received."

"Really?" Case asked, amazed. "You received write-ups like that?"

"Well, maybe not quite as bad, Forrest answered, "but his control theme of instructing is still evident."

"What's that? Jump on the student and see how much he can take and if he survives then upgrade him?" Case commented caustically.

"No, not at all," Forrest said, as he swiveled around to be directly in front of Case. "Maybe I can clarify it a little. It deals with safety, my area, and standardization, your responsibility once you are upgraded. I believe that what the captain really means here is that he views your actions as somewhat irresponsible, complacent, nonmotivating, and sloppy. All that in his eyes adds up to a nonprofessional pilot with an unsafe attitude." Forrest paused for a few seconds to let his words sink in. "I'm not an instructor in the aircraft," Forrest continued, "but I have had experience as a teacher before Uncle Sam said, 'C'mere, Son,' so maybe my philosophies on this subject will be of help."

"Oh, brother," thought Case, "more cockpit philosophies, just what I need."

"I know that the one thing you don't want to hear are my book philosophies on safety," continued Forrest, "or what I think a professional is. We get that at safety meetings and we studied it at OTS, but maybe something concrete and visible would be of help to you."

At this, Case perked up. "Yeah, I need something I can show Coasty and say, 'Here I'm safe, I'm professional, what about this?' "

"Well, I don't know about that," Forrest interrupted, "but let's look at the whole flying game we are involved in. What are you in upgrade training for?"

"Why, aircraft commander, what else," shot back Case, slightly ruffled.

"O.K., what will your job be as an aircraft commander?" asked Forrest.

Professionalism

"Well, hell, to fly the left seat and get that air machine from point A to point B in one piece," Case provided.

"What else?" asked Forrest.

"Well — I guess you're getting at being a crew commander, or something like that. Yeah, I guess I have to be able to control a crew, but above all, everyone says it's to hack the mission, right, whatever it takes." Case replied.

At this, Forrest seemed surprised, and amused, but shot back seriously, "I can see you have been reading a lot of old Air Force stories and embellish their ideas. As you say, we must accomplish the mission, but the mission description now has an added word — 'safety.' How we perform the mission directly relates to that last word. If we do the mission as true professionals, the word 'safety' never directly enters the picture. It is a natural consequence of our actions. Do you follow me so far?"

"I think so," replied Case, somewhat taken aback by such high-sounding ideas from someone only a few months his senior.

"Sure, our job is to fly the aeromachine, but we also have a crew to help us," continued Forrest, "and how we use the crew will determine the outcome of any mission. Agreed?"

"Yeah, I guess so," answered Case, "but those guys know their job; you let them do it and it will get done, no sweat," he contended.

"Well, maybe so," Forrest answered, "but sometimes we all need motivation, right? Now, where do you or I get our motivation? It has to come from our leadership in the unit, right? In the same way your crew members will occasionally need some motivation. And they will take their key from the man at the yoke — and that's you. Now if you are sloppy, complacent, or, as Coasty puts it, nonprofessional, what is their motivation?" Without giving Case a chance to butt in, Forrest continued. "What did we learn in that early part of the S.O.S. correspondence course about leadership? One of the best forms of leadership is by example, right? So what a crew member sees in you, he will see as the standard to be applied to his own position. Maybe this won't happen on one trip or over a few days, but with our new integral crew system, he could be with you for a year or more. Now, how do you think he's going to react to your attitude on a daily basis? My feeling is that it will directly effect his, no matter how professional he may have been prior to coming on your crew. Backsliding can affect each and every one of us!"

"Yeah, but if that guy is sharp, I'm not going to affect him very much. Besides, stan board still checks on him," Case rebutted.

"Sure, but if someone who is slightly weak, or new to the aircraft, is assigned to your crew, now what do you do? After you get a crew you will be evaluated as an integral crew, and judged on your ability to work together, not individually. Your attitude will prevail over the crew, and if it's nonprofessional, you could really blow it in a big way. If one man fails because of you, the whole crew fails, and that's heavy to me and has far-reaching effects!"

"Boy, you better believe it," mused Case. "Hey, you're making this aircraft commander thing out to be not such a good thing after all. I don't like being a patsy for the whole crew just because one of them screws up."

"Not so!" Forrest butted in. "Like the commander told me during my certification board, it's the best job in the Air Force, but it carries some heavy responsibilities, the biggest of which is your crew and how you perform the mission with them. Well . . . those are my thoughts on this whole thing. Say, why don't you talk to Captain Wonder about this? He's been an aircraft commander for a year now and is upgrading to instructor. Maybe he can give you a key to this whole game. I didn't mean to bore you. Plus, I don't think Coasty is out to get you. He's hard on this subject, but is your instructor. It's his technique, and success is the measure of whatever technique he uses."

"Yeah, I guess so . . . thanks," Case muttered as he wandered from the safety office to find Captain Wonder.

He found him later in his favorite haunt, the O'Club casual bar, studying the leggy barmaid. Bobsy, as his friends called him, was single, and helped keep the casual bar in business — to keep his "stock" up, he often said.

"Hey, Wonderboy," Case called. He almost forgot to get his hat off when he entered, and Wonder was reaching for the bell cord.

"That was close," yelled Wonder. "What are you drinking?"

"Oh, give me a tonic, I guess," Case answered as he pulled up a stool and slouched over the bar.

"What's up?" Wonder asked. "Fly today?"

"Yeah, you might say that. I flew, and ole Coasty criticized. Told me I was an unprofessional puke!"

At this, Wonder sat up in his chair with eyes wide. "Hey, that's heavy. What did you do, hit something or criticize one of his landings?" Wonder paused at the joke, but Case didn't smile. Again the

day's story was told, but with less enthusiasm and sarcasm. The browbeating from Forrest had taken its toll.

"Anyway, Forrest said to talk to you about this aircraft commander thing. Maybe I'm missing something, or you can give me a crutch, or whatever." Case stopped talking and gulped his drink, even swallowing the lime!

"Say, Bubbles, another slurp for my friend," Wonder called to the bartender. Then he took a long look at Case. "Well, it sounds like old Coasty's really pushed you today. But, then, he's always been like that, even when he was just an aircraft commander. I know. He got me the other day and really pounded on me with his hobnails for not demanding more out of the student and not letting him know his crew coordination was lousy."

"Well, how do you make sure that all your decisions are correct, your judgment flawless, and you're always safety conscious?" Case asked rhetorically.

"Boy, that's heavy," Wonder mused, "but I'll tell you a bit of my story. I got a crew a few months after upgrading, and we really worked hard together. Then we got our integral crew evaluation from Captain Krowzchek and his crew of black hats. Talk about ripping us a new one. We got through it, but he Q/T'd me for several crew coordination items, such as calling crew members by their first names and for letting my copilot get by when a crew member used a wrong response to the checklist. Man, he laid it all right on me and said that obviously it had been going on for some time, otherwise the crew would not do it too. That's when it really hit me about Coasty's philosophy of professionalism, and I had to admit that we became pretty cocky, and let the little things slide. And it's the little things that make the difference — on check rides and on accidents — if you can believe the safety people. So after that I really got on the stick, and the crew backed me entirely. I thought they would resent the separation — Sergeant this, Sergeant that, Lieutenant Colonel this — but not one word from anyone. A no-notice by stan board the other day got us laudatory comments. And in a debriefing with the commander, he congratulated us for our efforts. That really meant a lot to me."

"Yeah, I guess in that situation it would be worth it," Case replied, "but what about this safety thing? That's got me worried now. Mainly for my own tail, I guess."

"I don't think I ever really consciously worry about safety," Wonder answered, "not now that the crew is behind me. I feel that we do everything safely because we are doing the job within all the parameters that ops and standardization set down and we do the best we can. Now, everytime I realize that we let a small thing slide, a checklist response, a briefing item, or whatever, I get a cold chill down my spine. I guess that's my safety consciousness or whatever, and that brings it all back in for us. Can you follow me, or am I off in never-never land?" asked Wonder breathlessly.

"No, I think I read you." Case straightened up on the barstool, sipped his drink, and continued. "What I hear you, Forrest, and even Coasty saying now is that there is a yardstick to judge our actions by. That safety and professionalism, while nebulous terms by themselves, can be qualitatively measured in our every action, both with the aircraft and a crew. Am I on the track?"

"Yeah, I'll agree with that," Wonder said, "and if you wanted to quantify something, let's say that you are at the very peak of your personal proficiency and every action is keyed to the precise right direction. Then, every time you let a checklist response slide, slip a briefing item, or slide an approach plate restriction, you are cutting yourself down from the pinnacle. You are less than your most professional and safe self. How's that for a Wonderism? Maybe I should be a safety weenie," he mused to no one in particular.

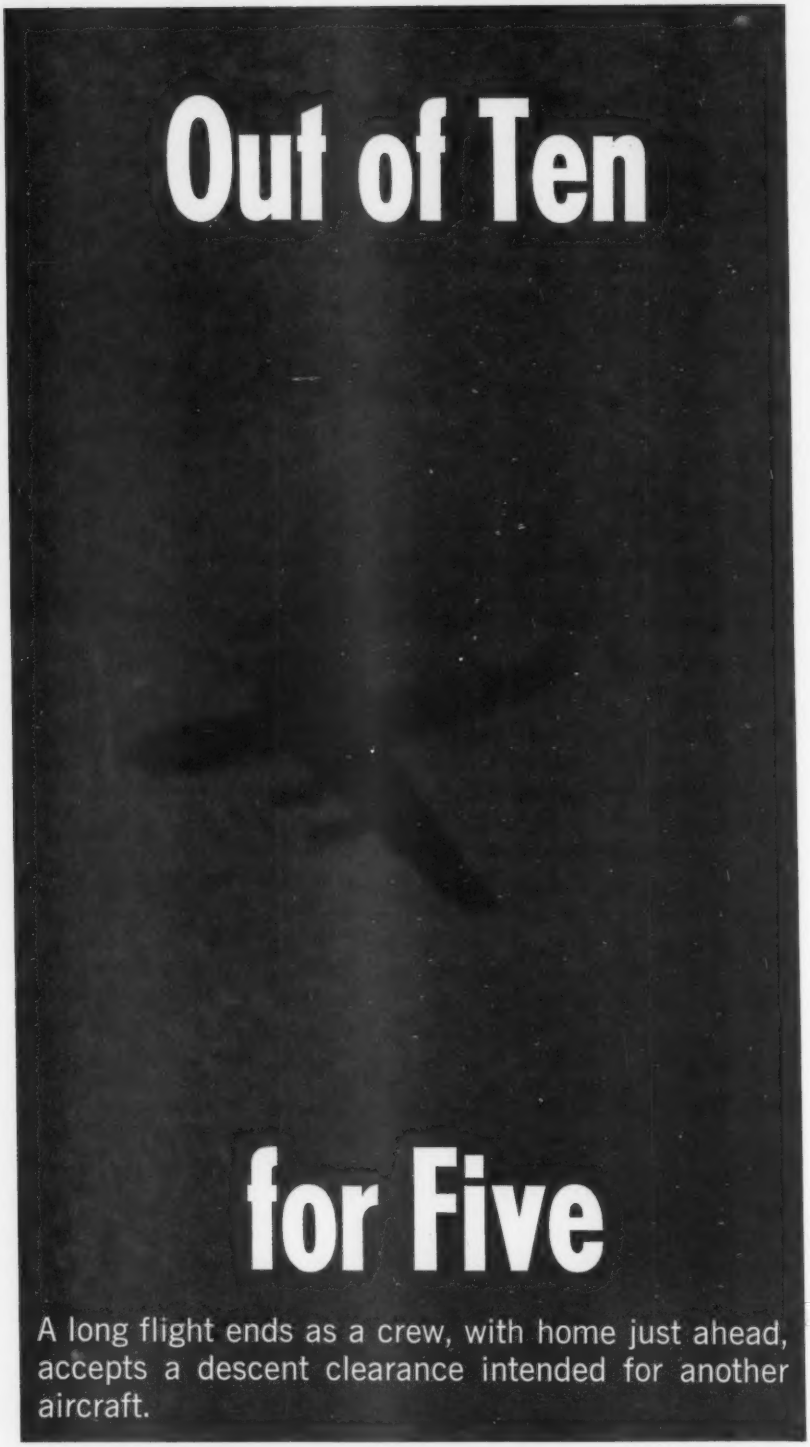
"I'll buy it," Case replied as he jumped from the barstool. "Gotta run. I believe my yardstick needs a bit of an extension!"

He slapped his hat on and was out the door before Wonder could grab the bell-pull. "Coasty strikes again," mused Wonder. "I only hope I can do half as well."

ABOUT THE AUTHOR

Captain Cecil majored in electrical engineering at the University of Arkansas, where he received his commission through the AFROTC program. After completing pilot training in 1968, he flew a combat tour at Da Nang Air Base in C-123s. Since then, he has been assigned to the 76 ARRS at Hickam. He has over 2,000 hours in the HC-130.

Out of Ten for Five



A long flight ends as a crew, with home just ahead, accepts a descent clearance intended for another aircraft.

A C-141, returning from a long mission, winged eastward at flight level 370. As the plane approached the coast, its electronic equipment picked up the clear, comforting VHF radio communications that signaled radar contact with an ATC center. Dormant for many hours since departing Asian shores, VOR and tacan indicators in the cockpit gradually strengthened their grip on navigation facilities ahead.

The aircraft banked toward the southeast as it passed over a small island. Another island lay ahead and home base was 90 miles beyond.

As the radar blip moved southeast, Center issued en route descent clearance and sequenced the flight for radar handoff and terminal arrival with an adjacent center.

The controller directing the aircraft contacted his counterpart for a radar handoff.

"Go ahead," replied the receiving controller.

" . . . MAC (call sign) cleared to fifteen," informed the first controller.

Scanning his radar scope, the receiving controller spotted the C-141 blip and confirmed radar contact.

As the aircraft descended toward 15,000 feet, the crew tried to contact the center that was taking control. " . . . Center, MAC (call sign) is passing three two thousand for one five thousand."

"MAC (call sign) ident. Fly heading one five zero, vectors to (home base). Runway one six in use. Expect a PAR."

Apparently unaware that Center had responded to their initial call,

the crew radioed again. " . . . Center, MAC (call sign) is passing three one zero for one five thousand."

The controller issued the same instructions again but there was no response from the flight. The controller contacted the center that had just relinquished control of the plane, stated the communication problem, and asked the controller to pass on an alternate frequency to the flight should it check back in.

Meanwhile, the C-141 crew continued trying to contact its new controlling agency. The controller switched to guard frequency and directed the flight to switch to another frequency.

"MAC (call sign), . . . Center, how do you hear me?"

"Okay, sir. Got you loud and clear now," came the reply.

"Okay, turn right heading one six zero for PAR approach, runway one six," directed the controller.

The flight acknowledged and complied with the controller's instructions. The controller directed it to level off at 17,000 feet and to expect further descent in 30 miles.

Meanwhile, a Navy fighter approaching its home base contacted the same controller, who then gave it approach and landing information. The controller was also coordinating clearances with other arriving and departing aircraft. Moments later the MAC flight advised that it was level at 17,000 feet.

"Roger, now cleared to one zero thousand and left to one five zero," replied Center.

"One zero thousand, left to one five zero." confirmed the MAC crew.

Positioning the Navy fighter, Center directed it on a northwest vector and issued descent clearance to 10,000 feet. Then two commercial flights momentarily commanded the controller's attention for arrival sequencing.

About 60 miles from home base, the MAC flight informed Center that it was level at 10,000 feet.

" . . . maintain five thousand," directed the controller.

"Five thousand. MAC (call sign) is out of ten," acknowledged the flight.

As the DME clicked off the distance to his base, the Navy pilot radioed, " . . . Center, (Navy call sign) level at ten thousand." The controller immediately questioned the Navy pilot.

" . . . level at five?"

"Negative, level at ten," repeated the Navy bird.

The controller cleared the fighter to 5,000 and handed him off to another sector.

Another radar controller, anticipating handoff of the MAC aircraft, could not locate it on his scope. So he contacted the original controller.

"Yeh, this is Two. Where is MAC (call sign)?"

" . . . I forgot to ship him to you. Stand by," answered the original controller.

"Where is he though?" questioned the second controller.

After twice attempting to call the C-141, the original controller answered, "Good question. I saw him one fifty heading down by . . . . "

Repeated attempts to raise the C-141 failed.

* * *

The Starlifter had impacted a mountain some 150 feet below the peak. The force of the impact triggered an avalanche that buried much of the wreckage in the valley below. There were no survivors.

The crew had complied with a center descent clearance intended for the Navy aircraft in another sector. The crew acknowledged, apparently without question, the clearance that placed them below the mountain peaks.

In spite of the fact that three pilots and three navigators were aboard the aircraft, apparently none of them detected the erroneous clearance. What caused this crew to overlook safe terrain? No one knows for sure. Perhaps the crew became overconfident upon hearing the words "radar contact" after hours of monotonous oceanic flying. They were probably weary after a long day and might have failed to crosscheck their Tactical Pilotage Charts (TPC's) and other en route publications specifying minimum safe altitude information. Get-home-itis or something else may have distracted individual crew members from their respective responsibilities — including that of checking terrain. Overreliance on ATC radar probably contributed in part to this accident. Whatever the reasons for the crash, we would all do well to reflect upon the sequence of events leading up to this tragedy.

This accident has accelerated MAC and Air Force efforts to develop a cockpit device providing pilots with amplified terrain clearance data for reference during descent and approach phases of flight. Several prototypes are currently being evaluated.

Weight and

Overloading one's body is somewhat like overgrossing an aircraft. Those extra pounds may cause the old ticker to strain past the design limits.

by Col (Dr.) John R. Wiley
Commander, USAF Medical Center
McGuire AFB, N. J.

Have you ever wondered why fat people are the butt of so many jokes and bear the brunt of so much fun-poking? Or, perhaps, if you're overweight, you find refuge in the fact that others refer to you as portly, stocky, or stout. Well, folks, here comes the bitter pill. Those are simply less humorous ways of saying fat, obese, and corpulent.

Being fat is no laughing matter. If you don't believe it, take a look at what it does to your insurance premiums. If you are overweight, your chances for a premature one-way trip to the marble garden are increased by: 150 percent as a result of cardiovascular disease, 205 percent from gall bladder disease, 225 percent from appendicitis, 385 percent from diabetes. Expressed in terms of the most likely reason you will meet your Maker:

Factor	Will die of Heart Disease or Stroke
American	50%
American, Overweight	60%
American, Overweight, age 40+	80%
American, Overweight, age 40+, with high blood pressure or diabetes	95%

Fat aviators have additional difficulties, such as additional risks in safe ejection and escape from aircraft, discomfort due to a tight (mis)fit in the cockpit, and increased proneness to aeroembolism (decompression sickness, bends, chokes, etc.).

Big Eaters

Medical authorities still agree that the primary cause of obesity is overeating. Glandular malfunction rarely plays a contributory role, but even when it does, then the one immediate cause is still a caloric intake persistently exceeding the calorie output. Since almost all military personnel are in relatively good internal condition, the possibility of glandular disease almost certainly is not a significant problem. And this business of "hereditary obesity" can be boiled down mostly to an "inheritance" of faulty eating habits — handed down from hand to mouth, you might say.

The capacity of the body to store protein and carbohydrates is limited. So excess food in any form, be it steak, peanuts, whisky, or bananas, is converted into fat and then stored. Of course this fat is highly adaptable and can be molded into attractive arrangements. It can be elevated, stretched, flattened, depressed, pointed, minimized, maximized, or borrowed to conform with an image more suitable for females. The most suitable male image is, and will probably continue to be,

Balance for Thought

a slim and trim form. So the best thing you fellows can do with adipose is get rid of it if you have it and avoid it like the plague if you don't.

To help you fight the battle of the bulge, we have come up with the followng suggestions:

Eat all you want — but try not to swallow.

Have someone prepare a series of poisoned pen mottoes for your use:

At dinner, a slip of paper falls from your napkin with the words, "Try arsenic — few calories."

In a box of candy there is a notice, "Better you should get lung cancer."

Our fatman's special is designed for serious situations and reads, "I am a compulsive eater, a real 'foodoholic.' If found in a candy store, soda fountain, or a bar, please notify my next of kin, open my collar, and tighten my belt."

While these suggestions are more humorous than useful, I make them to stress a point, and that is at least do something about your overweight condition. That's the important thing. But don't ask your neighbor what to do. There's too much bad advice going around these days, and you might catch it. And don't go overboard on a crash diet either. It took you months and years to add those pounds around your gut, so don't try to remove them in a week. Weight reduction should be a slow process but, like the turtle, you won't get anywhere until you stick your neck out.

Stick it out and see your physician! Significant weight reduction requires medical supervision. Radical reducing programs may be dangerously deficient in essential nutrients or may cause metabolic upsets that will put your "machinery" out of whack. The aim in dieting is to obtain proper nutrition but at the same time avoid large doses of calories. Your doctor can help you do that. See him. Then do what he says. He can tell you the safe and sane way to take it off. And he can make it easier for you. But for those of us with an overweight problem, correcting it will still take will power.

If you're in short supply of this item, it is helpful to remember that only three people stand to gain from your being overweight:

1. The man who will move up into your job sooner than he expected.

2. Your insurance beneficiary who will collect sooner than expected.

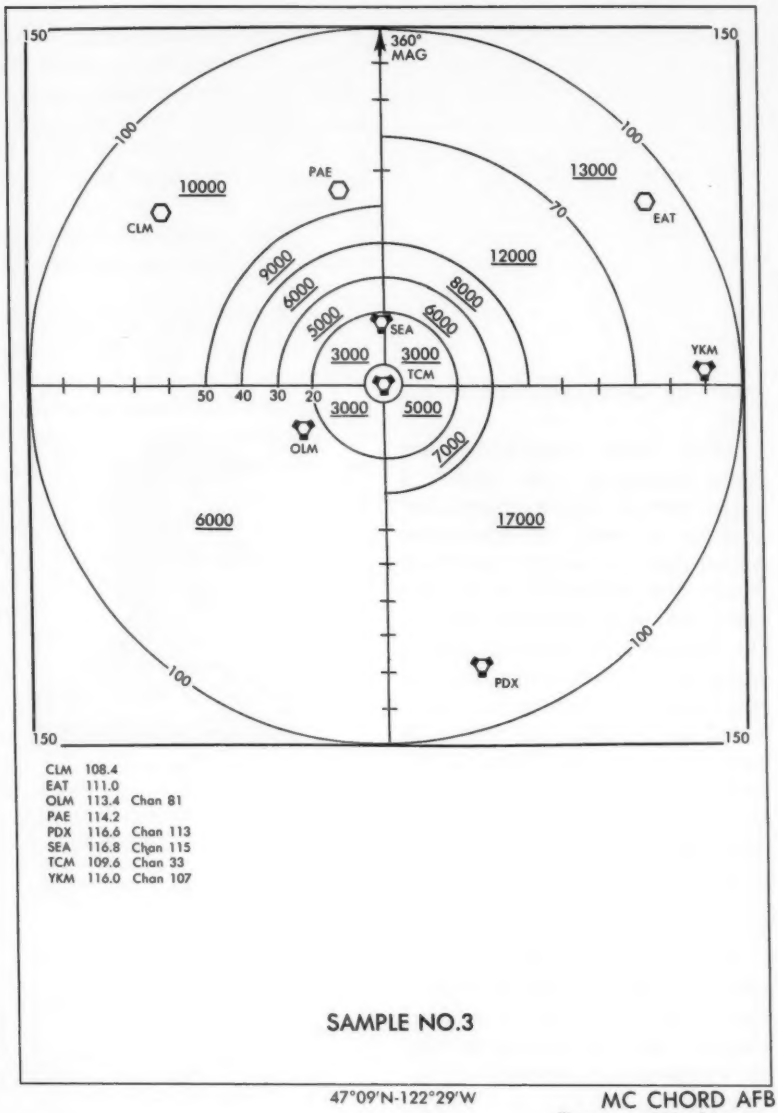
3. The friendly undertaker who has enough business without yours.

ABOUT THE AUTHOR

A native of Honolulu, Hawaii, Colonel (Dr.) Wiley received a BS degree from the University of New Mexico in 1952, an MD degree from the University of Colorado School of Medicine in 1957, a master's degree in preventative medicine from John Hopkins School of Public Health and Preventative Medicine in 1962, and was certified as a Specialist in Aviation Medicine by the American Board of Preventative Medicine in 1966. As a flight surgeon, he has accumulated over 2,400 hours of flying time. Colonel Wiley is commander of the USAF Clinic at McGuire AFB, N. J.

An Idea from the Line

It can be done. A couple of MAC aircrew members attract Pentagon attention with their method for solving the terrain clearance problem.



This is a sample of the chart suggested by Lts Mitchell and Montgomery. It is one of several prototypes being considered. Minimum safe altitudes are underlined.

Two MAC aircrew members, one a copilot and the other a navigator, have developed a concept for a terminal obstruction clearance chart that could become an Air Force requirement. The officers have briefed their plan at MAC headquarters and at the Pentagon.

The chart is being considered by the Air Force study group that is working toward a cockpit aid to provide minimum altitude information during critical phases of flight. The lack of a simple method for pilots to determine the minimum safe altitude while operating outside of established routes has figured in several recent aircraft accidents.

The two officers responsible for the new concept are 1st Lt James E. Montgomery, a C-130 copilot, and 1st Lt Charles T. Mitchell, a navigator, both of the 39 TAS at Pope AFB, N. C. They believe their brainchild will help fill a gap that has existed for some time.

"We just tried to think of something that would benefit us, under the same circumstances, in the air," commented Lieutenant

Mitchell, "and this is what we came up with. We realize that any of us can make mistakes in flight and this might prevent it from happening."

Their proposed chart stood at the top of the agenda when the Air Force study task group met at Richards-Gebaur AFB, Mo., in April.

As aircrew members, Montgomery and Mitchell were very interested in the details of a C-141 crash that occurred when the aircraft descended into the ground after a radar controller issued it instructions intended for another plane. During their discussion of the accident, the two officers identified what they considered a glaring omission in the present terminal area procedures — the nonavailablity of cockpit terrain clearance data for aircraft operating in the poorly defined areas between airways and the area covered in instrument approach plates. While the terrain height is available on ONC and TPC maps used by the navigator, these aren't adaptable to all types of aircraft.

Their proposed chart displays minimum altitudes for various sectors within a distance of up to 100 miles from an airdrome. A small, convenient chart such as this could enable pilots to quickly check the minimum safe altitude for their position. In single place aircraft, the quick reference chart could prove especially beneficial.

There is no assurance that the proposal will be adopted. There are many obstacles to overcome before it can be adapted to the present system of air traffic control. But the basic concept is certain to be a strong factor in the final Air Force recommendation and the reception to this new idea bolsters the theory that ideas originating at lower echelons are listened to by those at higher echelons — if they are well thought out.

Not all of us come up with ideas that merit a Pentagon audience, but if you feel yours haven't been listened to as they should have, it could be that you haven't presented them to the right man or in the right manner. On the other hand, a supervisor or commander who refuses to listen seriously to a "different" idea may be inadvertently robbing the Air Force of a valuable asset. Lieutenants Montgomery and Mitchell took the trouble to think out a plan — and their commanders all the way up the line took time to listen. The results of these two simple facts can't help but make flying safer.

Terrain Clearance Studied

Experts join forces to develop prototypes of terrain clearance charts.

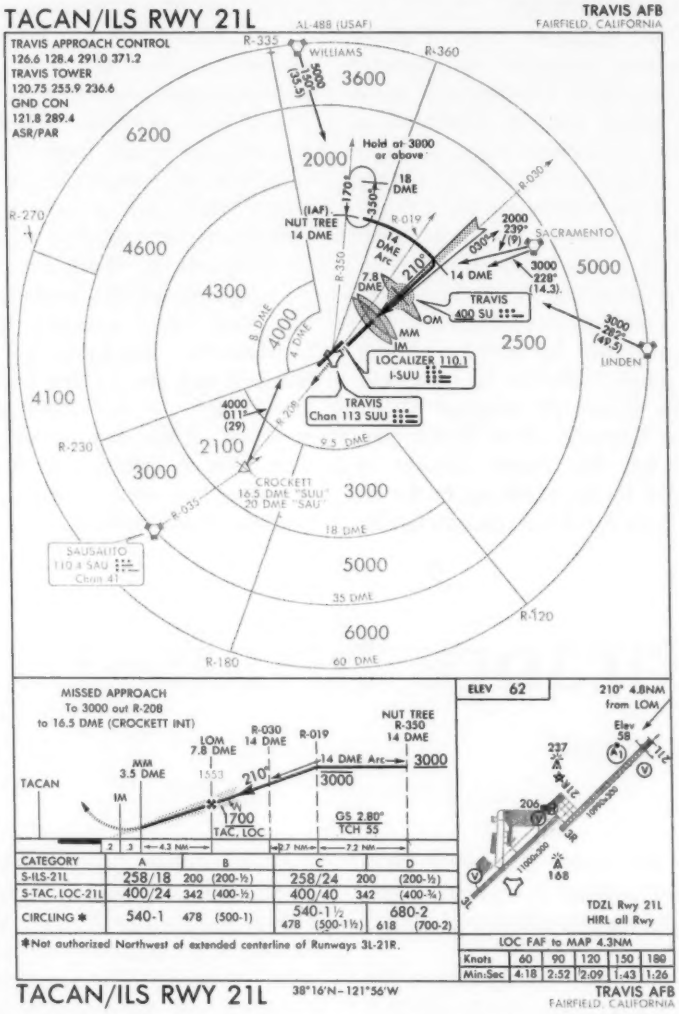
The efforts of an Air Force task group may soon result in a cockpit terminal chart that depicts minimum off-airways altitudes in an easy-to-read format. Such a device, initially proposed and developed by 1st Lieutenants James E. Montgomery and Charles T. Mitchell, 39 TAS, Pope AFB, N.C., would enable pilots to more accurately determine their aircraft position in relation to terrain during the arrival and departure phases of flight.

Under study are proposals for a cockpit product which will provide critical minimum safe altitude information for all phases of flight, not just while an aircraft is flying on established airways or feeder routes. Such a device, or procedure, is needed to allow a pilot to accurately determine his terrain clearance while flying under radar vectors or direct clearances en route to the published approach procedure path.

The task group met at Richards-Gebaur AFB, Mo., in the spring and discussed requirements for

Terrain Clearance Studied

an immediate solution, a near-term solution, and a long-range solution to the problem. Attending were representatives from USAF, MAC, the Air Force Instrument Flight Center, the Defense Mapping Agency Aerospace Center, and the Air Force Communications Service. Several prototype cockpit devices were under consideration at the time of this writing.



A prototype depicting minimum vector altitudes through the use of an overprint on a standard low altitude instrument approach plate. To determine the effect of color, the vector altitudes and circular lines on this chart were printed in light green.

One of the immediate goals is to make this minimum altitude information available to pilots by fall. In the mill is a compass rose overprint on ONC and TPC charts for certain terminal areas. The overprint will depict minimum safe altitudes and will include areas outside those shown on approach plates. Not as close at hand is a "near-term" concept that includes developing and implanting STAR-type procedures by mid-1977 for all designated terminal areas within the CONUS.

As a long-term fix, the group viewed the possibility of developing aircraft and ground hardware to allow transmission and reception of video information relative to routes of flight, destination weather, MEA, MOCA, Notams, SIDs, and instrument approach plates.

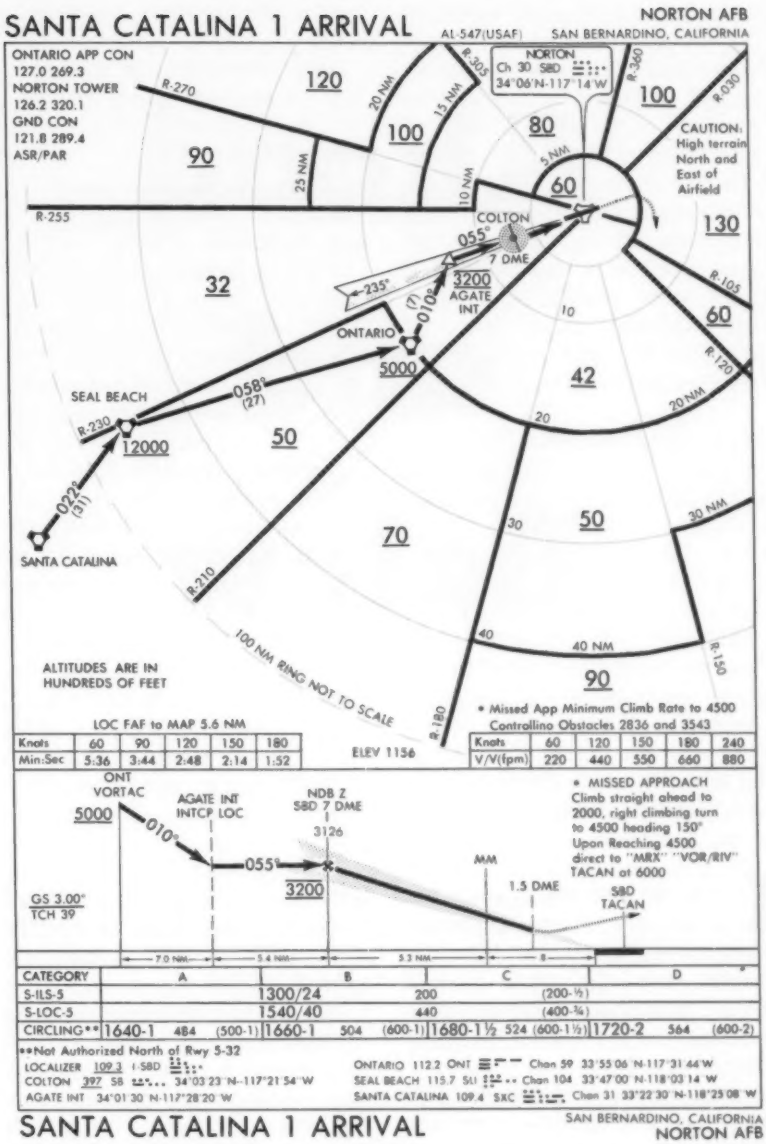
One possible interim solution that came under discussion was an instrument approach plate modification. This would involve devising an overlay on the approach plate, dividing it into pie-shaped sectors. Minimum safe altitude would be depicted for each sector. The proposed chart is similar to that used by air traffic controllers to determine minimum vector altitudes. Integrated into the system would be TACAN, VORTAC, and DME information. Similar information could be depicted on SID charts for use dur-

The plates accompanying these two articles are prototypes only and have not been approved for use.

ing climbout to provide terrain information to pilots in the event radar vectors placed their aircraft outside the confines of the SID. The feasibility of overprinting current en route charts to depict off-airway routes and altitude data was also mentioned as a desired addition.

The STAR-type concept would establish routes from airways to the final approach fix of the instrument approach procedure. A graphic display would portray the STAR terminating at the final approach fix. This concept could replace the current en route descent or penetration, if adopted. It could be flown with or without radar assistance. Minimum safe altitudes would be published on each segment of the STAR, allowing the pilot to doublecheck those directed by the air traffic controller.

While these proposals were still in their infancy when this article was written, aircrews can anticipate an additional cockpit aid in the near future. Many of the details have already been worked out and proposals are firming up as you read this.



This preferred arrival plate could eventually replace both the high and low altitude approach plates. Extensive coordination with FAA, the Air Force Communications Service, and local agencies would be required.

Ready to descend or change headings? A quick crosscheck of your position will help you avoid rocks in the sky.

Ahead and Below

by Maj Albert R. Barbin, Jr.
Associate Editor

In the last two years, while approaching their respective destinations, four separate aircrews descended their aircraft below published minimum safe altitudes in IFR conditions and ceased to exist.

Under radar guidance, three of the four crews complied with vectors and descent clearances that led to impact and destruction. The fourth crew, operating in a primitive air traffic control environment outside the United States, initiated a descent profile that failed to clear a cloud-obscured, 20,000-foot peak.

These and similar accidents by military and commercial aircraft call attention to a few common denominators. All occurred during the descent or approach phase of flight in IFR conditions, and the pilots descended below minimum safe altitudes in mountainous terrain.

Why? Was it the lack of visual cues caused by weather conditions? Overreliance on ATC radar?

Crew complacency? Disorientation? Preoccupation with other cockpit duties? Momentary distractions? In one of the ill-fated aircraft, three pilots and three navigators accepted, apparently without question, an altitude clearance 5,000 feet below the minimum safe altitude.

Many aircraft operational procedures, air directives, regulations, and the like have evolved from the errors and blood of the not so fortunate. The MAC Bible, MACR 55-1, and its Air Force counterpart, AFR 60-16, in essence, direct pilots and navigators to make use of all cockpit aids to insure terrain and obstruction clearance.

Insuring terrain avoidance should be an integral, instinctive part of a pilot's cockpit routine. A pilot doesn't have to be told repeatedly how to apply power and back pressure during takeoff roll. Once learned, it's instinctive. The same should also apply to terrain when descent clearances and radar vectors are issued.

". . . descend and maintain 4,000 feet." Check terrain! "Turn right, 360 degrees." Check terrain! "Cleared for approach..." Check terrain! Overly trite? No way! Ask some of MAC's veterans of the low 'n slow prop era, who often threaded their way through mountain ranges around the globe. In those days, cockpit terrain maps were constantly studied and clearances scrutinized before the Alpha Charlie pointed his machine in a new direction or lowered it to a new altitude. Cruising above MEA in those days was often a chore. Now, aircraft of days past have given way to sophisticated high flyers monitored by radar controllers buried in subterranean darkrooms. In view of recent civil and military air disasters in mountainous terrain, perhaps it's time for all pilots to reevaluate habit patterns and readopt a few "unsophisticated" terrain avoidance techniques.

Back to Basics

Let's take a look at some of the aeronautical terms that are most important during the initial or final phase of flight.

In both mountainous and nonmountainous terrain, minimum sector altitude provides only 1,000 feet of obstruction clearance from the highest sector obstacle within a distance of 25 nautical miles from the navigation facility identifying the initial or final approach fix. The minimum safe altitude around an air terminal is the highest sector altitude within 25 miles. This altitude data is annotated on DOD Low Altitude Instrument Approach procedures (letdown plates) in light blue, rectangular boxes near the blue ten-mile ring.

On high altitude procedures, emergency safe altitudes within 100 nautical miles and minimum safe altitudes within 25 miles are annotated in the lower left and right corners of approach plates.

The area within a 25 nautical mile radius of the final approach fix approximates 1,960 square miles (nautical), and each of the depicted minimum sector altitudes may cover a considerable piece of real estate. Within a given sector, a pilot has no way of pinpointing the location of obstructions if he uses only the DOD en route airway charts or letdown plates. The light blue, annotated minimum sector altitude on the approach plates indicates that high-rise terrain exists within a given sector — somewhere. If a sector is 180 degrees, high-rise terrain may occupy all or little of the 980 square mile area right up to the center of the approach depiction. Then how does a pilot thread his way down to the initial approach fix, through the weather, with sparse terrain information?

Present procedures require that while operating in a nonradar environment with clearance for a published instrument approach, a flight must maintain its last assigned altitude or minimum sector altitude, whichever is higher, until passing the initial approach fix. At this point, descent may begin to the published IAF altitude. The pilot then complies with the remainder of the approach. This technique may seem cumbersome at airports where there is a significant difference between sector and IAF altitudes, but it will guarantee terrain clearance.

In FAA-controlled areas, complete execution of a depicted instrument approach in a nonradar environment is becoming an endangered species. Instead, most instrument recoveries consist of radar vectors to an ILS or PAR final. Hearing the comforting transmission of "radar contact" in the descent or approach phase may, unfortunately, sometimes cause aircrews to lose interest in their own navigation. This can become hazardous because radar controllers have their own set of terrain clearance rules and minimum altitudes — called minimum vector altitudes. In determining minimum vector altitudes, sectors like those shown on approach plates are broken down into many mini-sectors; the total number is dependent upon terrain and obstacle height variations. For each mini-sector, there is a minimum vector altitude that can be and often is appreciably lower than the pilot's minimum sector altitude. Since there is no vector

Ahead and Below

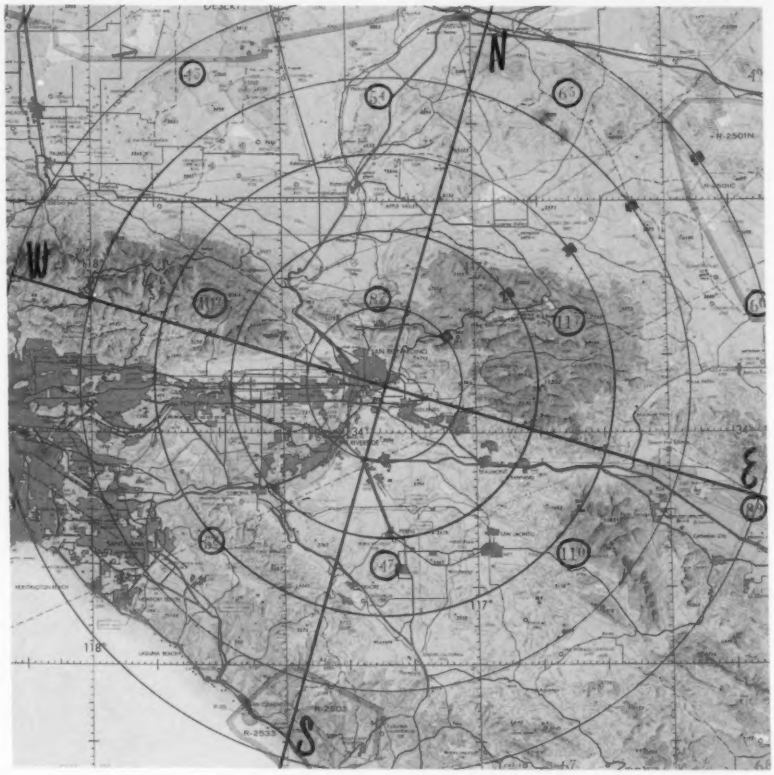
altitude chart in the cockpit, a pilot has no way of knowing what the minimum vector altitude is for a given terminal sector. He must query the controller if he suspects a discrepancy. Put another way, unless he keeps track of his own position, the pilot is dependent upon someone on the ground to provide him with vital terrain clearance information. But human error, aircraft misidentification, or ground equipment malfunction places the pilot in a dilemma. How low can he go? There are ways to tell.

Terrain in Technicolor

The Tactical Pilot Chart, or TPC, is an excellent terrain reference source. With a scale of 1:500,000, or one and one-half inches to 10 nautical miles, these multicolored maps are well suited for detailed terrain study prior to and during descent, departure, and approach. TPC's are broken down into half-degree blocks that range in area from 30 by 30 miles at the equator to approximately 30 by 23 miles over the central United States. Within each block, a bold two-digit number depicts the maximum terrain elevation within that block. For example, "53" indicates maximum terrain height of 5,300 feet, "126" indicates terrain up to 12,600 feet, and so on. In addition, 500-foot and 1,000-foot contour lines and color changes highlight areas of contrasting terrain. The terrain information on these charts helps fill a minimum altitude information void when flying off airways and in a radar environment.

Although not required by regulation or flight directive, one method pilots might consider to avoid an untimely flirtation with hazardous terrain is to stop by ops or route briefing and pick up a destination area TPC and prepare a "flimsy." An aid such as this can be prepared in less than 10 minutes. As a suggested technique, scribe five concentric circles from the destination airport at 10-mile intervals. Circle the two-digit maximum terrain elevations and other pertinent obstructions within the concentric circles. For a magnetic heading reference, plot in a north-south, east-west cross (TPC's are aligned to true north) according to the indicated variation. This will serve as an immediate in-flight terrain cross-check during low altitude maneuvering and as a warning against erroneous clearances. At least one U. S. airline provides a looseleaf binder of TPC-type destination flimsies for each crew prior to departure. Company policy requires the captain and first officer to review these prior to takeoff and en route descent.

The Air Force is currently studying a variety of proposals to de-



A "flimsy" of the Norton AFB area.

velop a cockpit product which will provide critical minimum safe altitude information during all phases of flight. But until such a device is available, it's up to pilots and navigators to insure terrain and obstruction clearance by effectively utilizing all minimum altitude information available.

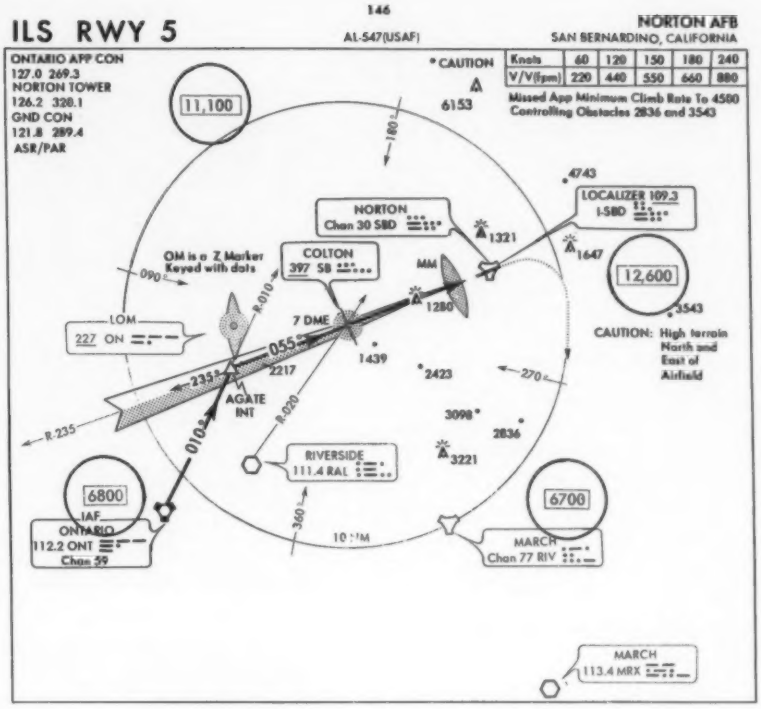
Crew Coordination

MAC aircraft operate within a variety of flight environments — from primitive airway structures to fully automated, radar-monitored systems. Flying from the former into the latter has and could again lead to a state of euphoria in the cockpit to the extent that maps are folded, the cockpit is tidied up, and per diem forms completed — while the aircraft is still better than a hundred out.

If you're an aircraft commander one way to avoid this euphoric malady is by being a nit-picker. Have the navigator monitor, cross-check, and plot aircraft position throughout the departure, enroute descent, radar vectors, and during the approach. Drop a few surprise questions like, "What's the MEA, minimum safe or sector altitude? How about the glide path intercept altitude?"

And don't forget your copilot. He's the communication go-between from aircraft to center and approach control. See that he routinely checks MEA's, sector and safe altitudes when receiving descent clearances, vectors, missed approach information, and reroutes.

Crew members occupying other than the left seat also have a vested interest in the safe conclusion of every flight. The co-



Minimum sector altitudes.

pilot, navigator, or "jump seat" pilot can prevent a disaster. The first priority is the complete execution of specific crew responsibilities, and accomplishing such functions requires knowing what the other guy is doing and "singing out" when something is amiss.

An airplane will only go wherever it's aimed. It doesn't know any better. When steered downward to destination or upward during departure, it can't see nor does it inform its crew of mountains and the like dead ahead. Pilots and navigators have to detect obstructions and hazardous terrain and aim their aeronautical steed around or above them.

Do you always know where you are and what's ahead and below your aircraft throughout the flight? If the answer is negative, then a future error or an omission could be your last. Errors concerning aircraft location relative to high-rise terrain seldom allow second chances.

No Time To Doubt

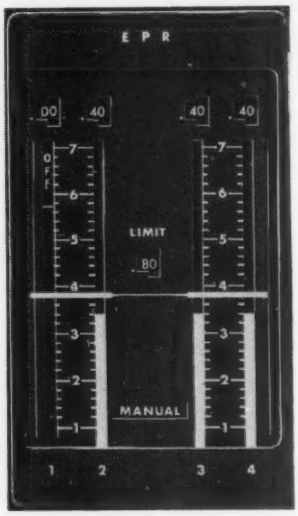
The decision whether or not to shut down an engine can be tough. But engine instruments can help you make the right choice.

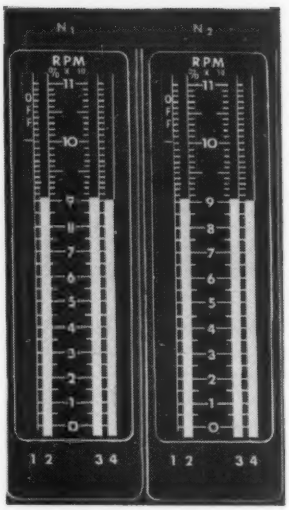
As the C-5 climbed through 6,000 feet, number one engine started coming unglued. Engine instruments and firewarning lights dictated an emergency return to the base where the crew completed an uneventful three-engine recovery.

On the ground, it quickly became apparent that something in the aft turbine section had disintegrated, spreading shrapnel and debris through the engine cowling and into the wing leading edge. Following engine removal and disassembly, mechanics discovered that the turbine midframe liner had failed, interfering with and diverting exhaust gas flow to the low pressure turbine. This misdirected high temperature exhaust flow forced the stage one low pressure turbine nozzle support aft into the rotating turbine disc and blades. The rubbing nozzle support quickly wore through the turbine blade shanks until they failed and the blades exited through the stator case and cowling.

Now just how long did it take from initial component failure to the time the engine began shedding blades through the cowling? Was the entire failure process instantaneous? Were there warning signs before irreversible damage was sustained? Could major engine failure and component destruction have been prevented by prompt crew analysis and action?

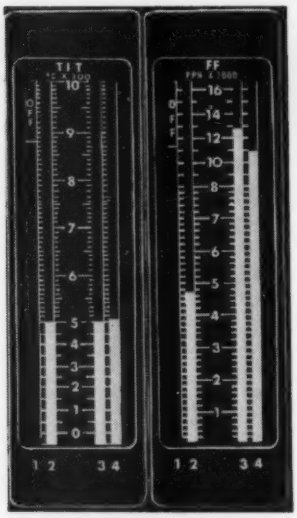
To answer these questions, the record of engine operation provided by MADARS (Maintenance Analysis Detection and Recording System) during the flight was reviewed. Here is a synopsis of the significant events:

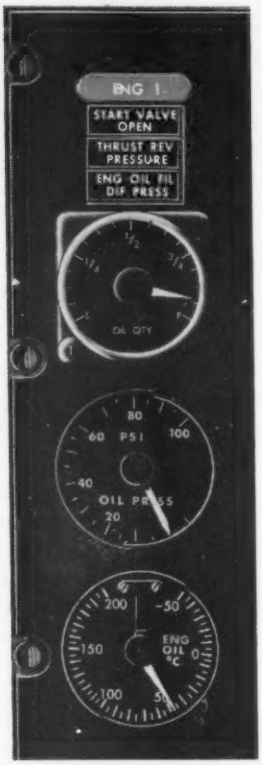




TIME	EVENT
20:11:17	Aircraft taxi begins. Number one engine is average. All parameters monitored by MADARS compare favorably with those of other engines.
20:14:04	Takeoff power applied. Number one still average.
20:14:22	Takeoff roll begins. Number one average, throttle angle 69.2 degrees. EPR 4.76, N1 94.4 percent, TIT 814° C, and fuel flow is 13,391 pounds per hour.
20:14:52	Lift off. Number one still average. No inconsistent readings have been observed.
20:16:01	Altitude 1,500 feet. Number one engine parameters fluctuating violently. Throttle angle not changed. EPR increases from 4.07 to 4.10, N1 drops from 94.4 percent to 86.6 percent, TIT increases from 833°C to 986°C, and fuel flow drops from 12,953 to 11,976 pounds per hour. Engine parameters recover after a few seconds but EPR and TIT remain high relative to previous readings.
20:16:20	Altitude 1,870 feet. Engine EPR increases to 4.14; TIT is 864°C. The crew reacts to the indications they probably have observed on the instruments. Throttle retarded. EPR drops to 4.11 but TIT does not change.

Engine Instuments





20:16:26 Power on number one reset. TIT and EPR do not change.

20:16:42 Power further reduced from throttle angle of 72.3 degrees.

20:16:46 TIT increases to 911°C — beyond engine limits. Pilot further reduces throttle but TIT does not significantly drop.

20:16:49 Power reduction stops at throttle angle of 49.8 degrees. TIT remains at 911°C.

20:17:25 Throttle has not changed. TIT decreases to 837°C. N1 is 72.2 percent. Power settings on the other three engines have not changed since takeoff.

20:17:26 Pilot advances number one throttle. TIT increases.

20:17:31 Throttle angle 53.7 degrees. TIT rises to 902° C—beyond limits again. Throttle advancement stops.

20:18:05 TIT still above 900°C limit. Pilot retards throttle back to 49.5 degrees throttle angle TIT drops to 885°C.

20:19:21 TIT slowly drops to 864°C. Pilot again advances throttle.

20:19:27 TIT shoots up to 934°C. Throttle advancement continues.

20:20:02 Throttle at full power setting. TIT rises to 1,000°C. N1 is 82.6 percent on the other engines.

20:20:19 Altitude is 6,200 feet. TIT drops from 997°C. N1 drops to zero.

20:20:21 Throttle chopped to idle. Engine fails.

20:20:31 Fire handle pulled. Aircraft remains in level flight.

What happened? For four and a half minutes the crew recognized and attempted to analyze a suspected problem with number one engine. They tried to feel the engine out, to determine if it was an engine problem or just bad instrument readouts.

They found out the hard way. Aloft is no place for extensive troubleshooting. When a series of instruments indicates trouble, the indications should not be doubted. Enough information can usually be obtained from the gauges to give crews a good idea what's wrong and to permit prompt correction.

Gathering malfunction data, symptoms, and the like for ground maintenance troops is fine, but not at the expense of damaging a critical system or losing an airplane.

After-the-fact observations of the records of this incident revealed that engine instrumentation was adequate and functioned normally. The lesson learned here is to believe multiple indications of abnormal engine operation. If an engine is exceeding normal operating limits, stopcock it or throttle back to idle before it has a chance to tear itself to pieces. Let the maintenance ground crews perform extensive troubleshooting. Believe the gauges. Give them a chance to tell their story.

—General Electric Jet Service News

Reflections of an Old

You might call me an "old head," although I'll admit to feeling uncomfortable thinking of myself that way. It seems like only yesterday that I graduated from basic flying training and left the TB-25 for an assignment in MATS, Atlantic Division, and the modern C-118. But, nowadays, when I climb on a C-141 to administer a "no notice," the aircraft commander is usually some guy who was still in grammar school when I reported in for my first assignment—at McGuire.

I like to think that I've learned a lot while making my way through 17 years in the MAC system; I know I've made a great many mistakes — like that rainy night at Harmon when I started a go-around, then spotted the runway and was about to land — after having retracted the gear. My copilot saved me that time. On other occasions my reprieve seemed to have emanated from a higher level.

Flying was easier back then — believe it or not. The aircraft were slower, and the enroute aids less accurate. But I still say it was easier. For one thing — and this may seem contradictory — we flew like hell back then. That's all we did — full time — whether in Connies, Shakeys, or C-118's. Most of us averaged around 100 hours a month. Sure, we flew a lot in the weather and at low level. But we didn't have to worry about forgetting to check the MEA. Most of the time we were trying to climb to it. Happiness often meant an en route VOR, but we were cocked for this type of flying. It was a way of life.

The Way It Was

Perhaps you won't believe it, but at one of our primary terminal stations the only instrument approach was off a radio range, and the primary runway was made of gravel. And as for a minimum equipment list (MEL) — we didn't even have one. Impossible you say? How did the AC know what he needed; how did maintenance know what to fix? Simple. If your aircraft broke, someone fixed it. When you reported to the squadron, you actually had an airplane that was "in commission" — really. And it was rare for the aircrew to generate even one 781 entry on preflight. But yesterday's aircraft were far less complicated than current airlifters. In those days we filed out through the Transport Control Center (TCC), the ancestor of the Operations Center. There was a rule back then that required all TCC officers to be an AC. The duty officer behind the counter always greeted crews with things like, "What time do you want your pax?" Or, "Fleet service has already been to your airplane." And the pax arrived on time. Furthermore, we had one of these TCC's at every en route and terminal stop. Starting to get the picture? With support like that, we would hit the blocks, deplane the passengers, refuel, refile, and block out within an hour! At least that's the way it seemed, but memories do fade and tend to recall the positive side.

Yes, the support was really tops in those days. But even more important than ground support is crew support. And I learned a lot about that while flying with numerous crew members over the years. One of the most significant things I learned was that no crew position is more important than that of the copilot. There are two types of copilots. The first is the

Head Flight Examiner

by Lt Col David W. Coville
MAC/DOV
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gear and flap puller. The second is the copilot who serves as aircrew coordinator, vice president, and overall safety monitor and is damned proud of it. The former is little more than a name on the crew orders. The latter is the guy who often prevents accidents.

Applying Principles

There are several principles that I always apply to copilots.

First, regardless of his age, rank, experience, or position, a copilot who doesn't understand why the AC is or isn't performing a specific action should never assume that the AC is correct. He should ask and verify.

A second bit of philosophy deals with the relationship between the AC and the rest of the crew. As in any other profession, there are some crew members who are more professional and capable than others. But I have never met one who would not do his best to add to the success of the mission — if he knew what was expected of him. Some crew members require very little guidance while others require a great deal. So, for the AC, there is one sure way of handling the situation — tell everyone on the crew exactly what you expect of him in sufficient detail to dispel any doubts. Start with the initial crew briefing and set the stage. Let your authority as an AC be degraded and not only have you lost your effectiveness, but the crew has lost its leader.

A reference to authority would not be appropriate in today's environment without a few words on the conflicts that occasionally arise in the exercise thereof. It is not unusual for an AC, at some point, to be "pressured" to move a mission. The only way to handle such a situation is to stay on top of it. If a maintenance problem is the issue, evaluate it thoroughly. Get the opinion of your flight engineer, check with the maintenance specialist, and determine what effect it will have on your particular mission. When all aspects of the situation have been reviewed to your satisfaction, make a decision and stick with it. More often than not, you will earn the respect, not the wrath, of whoever is exerting the pressure. You'll also retain the authority required to effectively operate the mission.

Another subject that merits comment is complacency. None of us exists completely free of complacency. It is easy for an instructor to be lulled into a secure feeling after a student has shot a couple of beautiful approaches and landings. Who would ever think the same student would head the plane for the trees on the very next approach?

The solution to this problem lies in mental discipline. If you're an instructor, mentally question every command that is issued from within or without the cockpit. If you are the copilot and the pilot calls, "gear up," following takeoff, verbally repeat that command prior to actuating the gear handle and use that moment of hesitation to check the VVI and altimeter and insure that a positive rate of climb has been established. Check the airspeed and bank angle when directed to raise the flaps. The same principle applies to that clearance routinely issued by the center you're working. Was the clearance really the way you filed, or was it for a different route? When circumnavigating a thunderstorm and the Nav says to take 20 degrees right, glance at the pilot's scope and verify the direction. That's the pattern. You may pick up a reputation as a nit-picker, but that's better than having been a great guy.

All I can add in the way of summarizing is to say that you guys have some great equipment, but performing safely is tough and requires effective leadership and perfect coordination. And that takes more effort than most of us like to admit.

ABOUT THE AUTHOR

Lt Col Coville is a 1956 graduate of the University of Connecticut where he received his Air Force commission through the ROTC program. Among the aircraft he has flown are the C-118, C-135, C-141, and C-5. He has flown a total of 10,768 hours, 4,686 of which were as an instructor or flight examiner. He holds a masters degree and is a graduate of the Armed Forces Staff College. Lt Col Coville until recently was assigned to the Directorate of Aircrew Standardization and Evaluation, Headquarters MAC, Scott AFB, Ill., and is now attending the Naval War College.

C.R. TERROR

"Well, Sammy m'boy," C. R. cooed as he waddled into the flight planning room, "the prodigious prognosticator with the crystal ball says this l'il ole administrative flight will be blessed with good weather all the way 'round the horn. Just a little gusty here, but that'll be no sweat."

"The last two legs will be at night," Sam, copilot to the World's Most Terrorific Pilot, said. "I wonder if there will be a moon tonight?"

"As a matter of fact, my trusty companion," the Round One beamed, "there is a new moon tonight. I checked the moon and stars display on my grandfather clock just this morning!"

"That sounds pretty scientific," Sam agreed.

"OK, once we get rid of our DV down in Sunshine Land, I may even let you have a landing or two."

"Thanks, Chief," Sammy replied, as he continued with the preflight paperwork. "When I finish here, are we going to the snack bar for a grease-burger?"

"No time for that, m'lad. I don't want all those stars waiting on me. I'll just run down the hall for the face-to-face, and then meet you at the magic carpet."

Sam couldn't believe it was the same fearless, devil-may-care C. R. he had known for so long. He actually appeared interested in doing the job professionally. He probably has the plane rigged to break for a crew rest in some exotic spot so he can frolic with the natives, Sam thought as he folded up the papers and prepared to post to the Sabreliner parked in front of ops. "At least the walk is short when you're carrying DV's," he remarked to the dispatcher, but he almost tripped when he saw C. R. actually doing a walk-around inspection! And he had the checklist — OPENED — in his hand!

The preflight was routine, except that C. R. briefed all the de-

For once the Master Manipulator does everything by the book — but loses the book at an en route stop.

tails this time. The first minor snag came when the Master Manipulator tried his headset and couldn't hear a thing over the interphone.

"Call the Chief of Maintenance! Get the protocol people on the horn! Get me an electrician!" C. R. thrashed.

"Try the interphone select switch," Sam calmly suggested.

Click.

"Er, thanks, Sammy, m'boy. I was just testing to see how you handled stress in a limited-time situation."

"Right, Chief."

When departure time rolled around and the DV hadn't yet arrived, C. R. began to get nervous again, but the general's aide came by and said it would be a few more minutes.

The wind, meanwhile, which had been steadily increasing, was now blowing right up the tailpipes of the T-39, prompting Sam to remark, "If the wind gets much stronger, we'll have to watch for a hot start."

"Good thinking, Sammy. Give that maintenance troop the high sign. Let's get a tug out here and turn our Teenie Weenie Airliner into the wind."

"But Sir, the General could be here any . . ."

"Nonsense! He's probably knowledgeably nodding in some boring briefing that won't be over for another 20 minutes."

By the time the power cart was unplugged, the tug hitched up, and the operation was 90 degrees into the turn, a blue staff car, flag flying, came around the corner onto the flight line.

"Keeeriminny!" C. R. shouted. "Hurry up!" But it was no use. No one was interested in having an accident with all that rank and assemblage watching. It took another ten minutes until they were finally ready to go.

* * *

The flight south was uneventful, and once on the ground, after the flurry of activity moved away with the DV, Sam and C. R. were left with the transient troops.

"Fill 'er up, m'lads, and once again we'll slip the surly bonds of earth on laughter-silvered wings." Then, turning to his long-suffering copilot, he said, "Lemme have one of them squash-flavored Life-Savers you been suckin' on." The maintenance troops watched in disbelief as the two pilots, one walking and one waddling, disappeared towards base ops.

The leg to northern Florida was routine and lasted about an hour, with Sam flying an outstanding approach through nonforecast clouds, light turbulence, and low visibility. C. R. winced as his co-jock planted the Sabreliner astride the centerline. "Not too shabby, Sammy, but you better make the next leg just as good, or I'll believe it was luck. Now shut down the left engine and we'll plan on an engine-running onload. We'll press through here ASAP and refuel at the next stop — L. A."

"L. A.?" Sam asked incredulously.

"Lower Alabama, of course."

They blocked in front of ops and looked about expectantly, but no passengers were to be seen. "Shut her down, Sam," C. R. moaned. "I guess we'll have to go in and see if our pax need spoon-feeding."

Even inside, no passengers were to be found. While Sam updated the weather, C. R. got on the horn and called the ops center. Sam overheard one side of the conversation and watched as C. R.'s neck and ears turned red.

"What do you mean the requirement for this stop was cancelled 36 hours ago? Why didn't you have the common courtesy to tell me that earlier? Do you know what it cost the taxpayers for us to come in here for nothing? You haven't heard the last of this!" And he hung up!

"Wheeww, you really unloaded on that poor duty officer," Sam said.

"Those jive turkeys are gonna have to get their stuff together, or this aviation business is gonna end up like the railroads!" C. R. snorted.

Despite his anger, C. R. had cooled by the time they ran the before-starting-engines checklist, and the night flight to Alabama was smooth and quiet. Weather was good, and Sammy's ILS faultless. As they turned off the runway, C. R. became talkative again.

"We'll put on a load of petrol to get us to the home-drome. I'll check the weather and you call the ops center. I don't want to talk to them again tonight."

"Yessir," Sam replied, as he

C.R. Terror

eased to a stop in front of ops.

This time the passengers were ready, and after a quick coke (C. R. lost the coin toss with Sam, despite trying to bluster his way into convincing Sam that the person who calls it correctly has to buy), they were ready to go again. When they walked out to the aircraft, they saw a big red pumper truck pulling into position.

"What's going on?" C. R. asked.

"Sir, we had a small fuel spill," the transient troop replied, "and I called the fire department to wash it down before we plug in your power cart."

"Ah yes, very good idea," C. R. said. "No point in taking any risks." But fifteen minutes later they were still standing there and the fireperson was still spraying down the area.

"Does that guy have stock in the water company or something?" C. R. demanded. "He's gonna float the ramp away!"

Finally, they were again almost ready to go. Sam was strapping into the cockpit when he heard C. R. shout.

"Sammy! Get out here!"

To Sam's surprise, C. R., checklist in one hand and flashlight in the other, was actually making a walk-around inspection at an en route stop! As Sam went outside, he found C. R. jumping up and down, in front of the right wing.

"Look at that! Look at that!" he shouted excitedly, waving his flashlight. Sam finally saw the object of C. R.'s attention. The single point refueling cover had been left on the wing. Gone unnoticed, it would have been lost or ingested by the number two engine.

"That's why you should always make a thorough walk-around, Sammy m'boy," C. R. boasted. "The CIF is full of tales of woe and misery caused by little oversights like this that are particularly easy to make at night or when the weather is bad. Let this be a lesson to you."

"Yessir, Chief," Sam replied obediently.

Gosh, thought Sammy, the boss has operated a mission safely, successfully, and with as much professionalism as I've seen. Sammy wondered whether there was a mysterious reason behind C. R.'s strange behavior. Yep, almost too good to be true, he reflected, on the final leg home.

"Well, Chief, looks like another hour and we can put this one to bed, all safe and sound."

"That's right, Sammy. You're never too new or too experienced to pay attention and give the taxpayers their money's worth. Besides, it contributes to your longevity to do the job right."

"Right, sir. Now if you'll pass me the folder with all the paperwork, I'll get it together for closeout immediately after we block in." From the look that crossed C. R.'s countenance, Sam knew he'd said the wrong thing.

"I left the whole folder on the weather counter in Alabama!" C. R. cried. Sam nodded. He knew it was too perfect to last.

After living the Air Rescue motto for nearly a quarter of a century, the 76 ARRS hangs it up at Hickam.

Spirit of the 76th

by Ms. Isobel Bryant
Managing Editor

It was November 1952. At Hickam Air Force Base, Hawaii, the 76th Aerospace Rescue and Recovery Squadron was being formed.

On the mainland, General Eisenhower and Adlai Stevenson were stomping the election trail in strenuous campaigns of whistlestops and speechmaking. "I Like Ike" buttons could be seen everywhere. As another bitter winter in Korea began, the nation hoped to elect a president who could end the war. In New York, audiences were flocking to see the new "Cinerama," and baseball's winning Yankee team had a bright, 20-year old star named Mickey Mantle. Scientists were still perfecting a polio vaccine and the "pill." Airlift crews were trying out the command's latest acquisition, the C-118 Liftmaster. And not until the end of the decade would Hawaii itself assume statehood.

A New Outfit

The aircrews who reported to duty with the newly formed 76th were the first in a long line of crews who would provide 22 and a half years of search and rescue service in that area of the Pacific — without an aircraft accident involving personnel error. Material failure caused one minor accident.

In those early days the pilots flew SB-29's, SA-16's, and H-19's as they assisted crews that had ditched in the ocean, evacuated injured or ill persons from vessels or on land, and searched for overdue aircraft. Their missions in support of AEC and NASA read like an American History lesson: Eniwetok-Bikini atomic energy tests in 1954, Project Mercury in 1963, Project Gemini in 1965, the lunar landing Apollo 11 mission in 1969, Skylab in 1973. Often it was the 76th that airdropped needed equipment to the Navy ships which stood by for the module recovery or made surface-to-air pickups in order to rush film or medical specimens to their laboratory destinations.

Enter PJ's

As the years passed, PJ's became part of the rescue scene, as did new aircraft, both HH-53C's and HC-130P's. As the number of missions increased, so did the pressure. But the need to become operational in the new helicopters and to train crews in aerial refueling and Skylab recoveries, all in minimum time, did not jeopardize the unit's outstanding flying safety program.

The men of the 76th put in long and tiring hours, sometimes on fruitless searches, often on precautionary intercept and escort of aircraft with minor problems, still more frequently on endless training missions under all types of adverse weather conditions. Altogether, more than 92,000 accident-free hours have been flown by 76th ARRS crews since 1952.

Twenty-two and a half years of continuing safe performance by the aircrews in this squadron are an exceptional accomplishment. The record is a credit to the high professionalism of its aircrew members, the reliability of maintenance personnel, and an energetic program of flying safety.

In July 1975 the 76th Aerospace Rescue and Recovery Squadron was disbanded, its record of safe flying unparalleled among MAC's rescue units. To those who served with this proud Squadron, we extend a salute and a farewell. You did a great job.

Hercules and the Lost Leading Edge

A C-130 had departed a southern base on an acceptance flight check mission following depot maintenance. After about 50 minutes of flight the crew executed the "emergency landing gear lowering" portion of the checkout. The aircraft suddenly entered a steep left bank; the pilot visually determined that approximately 22 feet of the left outboard wing leading edge was missing!

The humidity in the cockpit from crew perspiration diminished to an acceptable level once the pilots regained control of the Herk. A controllability check was performed, and the aircraft commander determined that sufficient control remained to land the aircraft using a final approach speed of 130 knots indicated and 50 percent flaps.

This saga of hyperventilation, rapid heartbeat, and perspiration was caused by improper installation of the lower hinge pin on the outboard section of the wing's leading edge. The leading edge blew off when subjected to air loads.

While nature's birds are known to fly perfectly missing a feather or two, we haven't quite reached that state of the art. Only the skill and cunning of intrepid aviators brought this Herky back safely.

Suspicions Confirmed

One of our staff officers recently attended a conference, the subject of which shall remain nameless. It's not often that you will find a collection of highly trained professional staff officers assembled in one room and dedicated solely to the intricate and demanding art of "weasel-wording." The following choice excerpts are submitted for your confusion:

. . . optional exception, where required.

. . . yes, but you should remember that the man who makes the equipment isn't always the man who makes the equipment.

. . . mandatory, but not really required unless you need it . . . .

. . . while it has been disapproved, this system is still being considered . . . .

. . . except where serious injuries or fatalities have occurred, the system has been generally satisfactory.

Suspicions confirmed? You bet!

TAC Attack

FOD: Familiar Object Damage

The total tariff on this one was about $26,000 and 52 man-hours. The destructive triad consisted of a C-130 engine, propeller, and cowling panel. These normally harmonious characters got together in rather unique fashion and when the dust cleared there was no winner.

The Hercules landed and taxied in and the crew deplaned, ostensibly without event. Then one crew member pointed out that a panel was missing from number three powerplant. Investigation revealed that the panel had been drawn into the prop during reverse thrust. De-icer boots on the prop were damaged and pieces of the panel and boots had been inhaled by the Allison engine. The crew reported no unusual vibration or roughness during flight.

The cause was determined to be poor through-flight procedures at an en route station. The dzus fasteners holding the panel in place had been fastened only on one side; the other three sides were loose. The panel remained in position during normal forward thrust, but the Hamilton Standard had no trouble dislodging it during the reversing operation.

Odd FOD, huh?

Ace of Aces

In aviation, an ace is a pilot who shoots down five enemy aircraft. In golf, an ace is a hole-in-one. But what do you call a golfer who shoots down an airplane with one shot? According to the Fresno General Aviation District Office which investigated the incident, this actually happened at a nearby Fort Washington golf course. A single-engine airplane doing low-level mosquito spraying was struck by a hard hit golf ball that passed through the whirling propeller, smashed through the windshield, bounced off the pilot's helmet, and shattered a side window. Although stunned by the impact and injured by flying glass, the pilot kept control of his aircraft and made an emergency landing at a nearby airstrip. In answer to the question, the pilot had his own name for the golfer who shot him down.

FAA World

Low Calorie Icing

Though the cake was not to be found, this T-39 got a taste of the icing.

The crew had pointed their Sabreliner toward a midwestern destination. Cruising at FL 390, the pilot detected some control problems. The yoke was frozen, disallowing fore and aft movement; the suspected culprit was icing. Aileron control was normal, and the aircrew decided to divert to a balmy southern base. The pilot adroitly executed a descent to 2,000 feet using power, trim, flaps, and speed brakes. It took about 45 minutes at the lower altitude to loosen up flight control rigging to achieve near normal response. Good thing too; the bird was getting low on petrol. The pilot chose a flat power-on approach at computed speed plus 15 and, using all available aft control and trim, he got the Sabreliner on the runway in good nose-up attitude.

The cause: suspected water accumulation in the cockpit flight control area. As a result of this incident, the external preflight checklist for the Sabreliner now requires the pilot to depress the cockpit drain valve.

The August heat tends to make crews forget about icing, but you high flyers should remember that winter temperatures lurk up there year round.

QS Shazam!

Lightning strikes twice, though not in the same place. C. R. Terror might blame Captain Marvel for these heavenly electrical displays, 'cause in both cases there was a definite paucity of thunderstorm activity.

About a half hour after takeoff the C-130 was cruising at FL160 when lightning struck its right wing. This large charge was totally uncalled for in that the observant navigator had his APN 59 tuned for weather avoidance and he detected no thunderstorm activity in the vicinity.

This appears to be a case of doing the right thing but getting zapped anyhow.

* * *

The other electrifying experience (just to show you that nobody's immune) involved a European-based helicopter and crew. The HH-53, headed for the U.K. from a central European base was at 8,000 feet, IFR. Actual weather had been intermittent IMC, and light snow, but no large buildups were sighted or forecast. About two and one-half hours into the flight, the aircraft was flying in and out of cloud tops, when lightning struck the main rotor blades. The chopper was cleared to descend off airways to VMC and proceeded direct to destination. The crew experienced no systems malfunctions or control difficulties. After an uneventful landing, the maintenance folks discovered small holes and burns resembling welds in all main and tail rotor blades.

Nose Gear Grief

A west coast crew had their hands full of Starlifter after the pilot made a smooth touchdown. Spoiler deployment was normal. But when the nose gear contacted the runway, things began to happen. First, the plane veered slightly to the right. This was countered with left rudder. As the airspeed decreased, rudder control also diminished and the C-141 appeared to be headed for the weeds when the nose wheel steering failed to respond. Emergency braking and differential power kept the Starlifter on the runway, but just barely. The big bird came to rest on the extreme right side of the runway.

Maintenance folks determined the cause: internal failure of the nose gear steering actuator assembly, most probably caused by a faulty control valve on the steering actuator.

Old scouts say be prepared for that "atta-boy" landing which can turn into the other variety (for which we haven't as yet developed a euphemism).

after deadline . . .

HAIR IN THE HOSE -- Aircrew members who wear wigs could experience obscured vision and difficult breathing when donning emergency sweep-on oxygen or smoke masks. During a recent Life Support training class at a west coast base, a few wig wearers were surprised when their hairpieces slid forward, lodged between the mask and their face, and plugged up the mask inhalation valve. Although AFR 35-10 permits the wear of wigs under certain conditions, an improperly secured hairpiece could constitute a hazard during rapid decompression or smoke and fume elimination. Denture grip for wigs, anyone?

STROBE LIGHTS IN THE HOLDING PATTERN -- A while ago, it seemed certain that many MAC aircraft were likely candidates for high intensity strobe beacons for mid-air collision avoidance. But the latest word from the Air Force Inspector General's office indicates that strobe lights may produce adverse psychological effects. Until further guidance and direction is received from the USAF IG and HQ USAF, Air Force Logistics Command is holding all strobe light actions.

NEXT MONTH -- Feature articles will include:

* "Second Chance," the third place winner of the 1975 MAC Flying Safety Writing Contest, captures the anguish of an aircrew nursing its distressed aircraft along, high over the Pacific.

* Articles penned by ARRS personnel highlight Rescue's past, present, and future and accent next month's issue with a Rescue flavor.

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Touch and Go

"MAN, THIS MUTHA REALLY CLIMBS WHEN YOU'RE LIGHT!"